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Privacy Statements, Information Sharing, and Web Purchasing

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ABSTRACT

Each year, billions of dollars in online spending are lost due to consumers' fears about information security. Many studies are concerned with methods reduce perceived risk in online transactions. Of the studies that evaluate the effect of structural assurances, few use actual or simulated purchasing scenarios. This study uses a simulated purchasing scenario where participants were shown either a graphical privacy statement or a textual statement. They were then surveyed on what personal information they would share and their intent to purchase from the website. The results from this sample led to the conclusion that willingness to share increased amounts of information did not result in increased intent to purchase. In addition, the simple graphical statement read did not increase purchasing intent. Finally, there was no moderating effect of statement type on willingness to share information.

Keywords

Trust, Privacy Statements, Structural Assurances.

INTRODUCTION

In this age of information, data sources are being merged across wide areas to pull together massive amounts of data on each individual in this country and throughout the world. The purposes for compiling this data are wide and varied. Examples range from identification of potential terrorists to determining the cancellation criteria for social security payments to marketing and risk reduction activities. As new technologies are developed to gather and store this data, the questions arise, what is the potential for information privacy invasion and what can be done to alleviate the fears of individuals?

Definitions vary for information privacy by each author and researcher on the subject and there is certainly no consensus among them (Pollach, 2005). Culnan (1999) defines information privacy as the right to know how and why information is collected, used, and protected, when it is used for other purposes, and the ability to object or seek redress. We can define information privacy as the interest of an individual in knowing the data being collected about them, having unrestricted access to that data, and control of, or at least significant influence over, the handling of that data. This definition makes clear the rules for membership, is useful and easily tested and applies to other areas. Moor's Publicity Principle states, "Rules and conditions governing private situations should be clear and known to the persons affected by them" (Moor, 1997, p.32). Because of this, websites need privacy policies such that consumers can be informed of the use of their personal information. This research seeks to determine the effect of privacy policies on web transactions.

Background and Justification

Since the 1990's, e-business and website transactions have become a major source of revenue for companies. The U.S. Census Bureau has forecasted that U.S. online retail sales will grow from \$172.4 billion to \$328.6 billion from 2005 to 2010 (U.S. Census Bureau, 2006). However, in 2006, \$2 billion, or about 2% of online spending was lost due to consumer information security concerns (InternetRetailer.com, 2006). Because of fears concerning personal information privacy, many studies have been conducted in the last five years to determine what factors affect trust in websites (Dinev and Hart, 2006; Hui, Teo and Lee, 2007; Malhotra, Kim and Argarwal, 2004; McKnight, Choudhury and Kacmar, 2002; Meinert et al., 2006; Mollick, 2006; Moores, 2005; Pan and Zinkhan, 2006; Rifon, LaRose and Choi, 2005; Srinivasan, 2004; Yang and Chiu, 2002). Structural assurances, in the form of privacy statements and seals, have been found to engender trust in websites. However, these studies did not focus on the effects of these assurances on information sharing during a simulated or actual transaction.

Problem Area or Research questions

Through a study of existing literature, we seek the answers to several questions. What specific topics need to be addressed in a privacy statement? Is the best method of displaying this information in long or succinct statements, or chart-like visualizations? Will consumers provide more information about themselves when policies are more easily synthesized and use more direct terms? Finally, my study extends prior research by answering the following question, does the willingness to provide more discrete elements of personal information result in the completion of a transaction?

LITERATURE REVIEW

Factors in Online Trust

Much has also been said about the factors affecting online trust and sharing personal information, in particular. Definitions of trust are as varied as those for information privacy. Komiak and Benbasat (2004) describe cognitive trust as relating to the rational expectation that a trustee can be relied upon whereas emotional trust relates to the emotional feeling that the trustee can be relied upon. Yousafzai, Pallister and Foxall (2005) explain that trust constructs allow individuals to feel safe in participating. Contemporary choice theory, as explained by Hui et al. (2007), places the maximization of utility as a major factor in information sharing. The request for large amounts of personal data results in a disutility whereby consumers avoid disclosures. The privacy concern factor has been identified by Rifon, LaRose and Choi (2005) to moderate the relationship between the use of seals and trust while Pan and Zinkhan (2006) found the privacy risk of losing control of information to moderate the relationship between privacy statements and trust. Another factor in online trust is the usage of structural assurances in the form of policy statements, seals, and third party assurances. Elliot and Speck (2005) state that structural assurances are needed to assure trustworthiness and give examples of research that shows how the use of structural assurances improves an individual's attitude to shopping online, their intent to shop online, their intent to purchase online, and their level of online shopping activity. Yousafzai et al. (2005) state that structural assurances are an institutional trust construct that allow individuals to feel safe in participating. In their research, they found that security and privacy policies lead to consumers developing high trustworthiness in the bank website in question.

Privacy Statements as a Requirement for Websites

According to Tavani (2007), online businesses must inform consumers of how their information is used and can be affected. Used as such, privacy statements reduce perceived risk and increase website usage as is described in the subsequent discussion. From a perceived risk standpoint, the previous section addresses the fact that privacy statements and other structural assurances increase a consumer's trust in a website. In addition, Culnan and Armstrong (1999) state "awareness of fairness procedures can address the privacy concerns associated with disclosure and use of personal information" (p. 112). As a result, when consumers are not told how their information is used, privacy becomes a factor in willingness to give data. Thus, privacy statements can alleviate privacy concerns. This view is shared by other authors who state that perception of privacy is a key concern of consumers' willingness to shop on a website (Dubelaar, Jevons and Parker, 2003), safe handling of information will facilitate transactions and communications (Miyazaki and Fernandez, 2001), companies that establish fair information practices reduce perceived risk, and disclosed procedural policies allow for increased information sharing (Culnan, 1999). From the website usage standpoint, 70% of consumers would use a website if privacy and security were assured (Udo, 2001). "Posting well developed privacy policies may lead to more repeat visits and purchases" (Liu and Arnett, 2002 p. 20). Although it has been shown that most people do not read privacy statements (Meinert, Peterson, Criswell, and Crossland, 2006; Pan and Zinkhan, 2006), those that do are looking to alleviate their perceived privacy risk and concern thereby increasing their trust and likelihood of completing a transaction. Finally, by not using a statement, websites are ultimately reducing a consumer's trust in their site (Pan and Zinkhan, 2006).

RESEARCH MODEL

Proposed Model

Meinert et al. (2006) places the level of protection promised by privacy statements as a moderator of a consumer's willingness to give different categories of information. In their survey, strong statements were shown to result in a greater mean willingness to provide information than moderate, weak, or nonexistent policies. Recently, Hui et al. (2007) conducted a study in Singapore to determine whether or not privacy statements and seals, used alone or together, impact information disclosure. They found that privacy seals had no effect on disclosure and privacy statements only had a marginal effect. This study seeks to extend the results and generalizability of Hui, Teo and Lee and Meinert et al. by asking participants to read the privacy statements of one of two actual websites for the purpose of determining the likelihood of their completing a transaction. Undertaking this study will determine which discrete elements of each information category, contact, biographical, and financial, consumers are willing to share in a transaction when directed to observe types of statements, short text and graphical. The proposed research model is presented in Figure 1.

Hypotheses

Hui et al. (2007) found that the more personal information is requested, the more likely it is that it will not be provided. However, the rational expectation that a trustee, or web merchant, can be relied upon allows individuals to feel safe while participating in activities (Komiak and Benbasat, 2004; Yousafzai et al., 2005). Further research also suggests that consumers are willing to share at least some personal information in order to participate in the online market and in addition, being more comfortable giving information means being more likely to shop (Dubelaar et al., 2003). It is hypothesized that:

- H1: The greater the number of discrete elements of personal information a consumer is willing to share (total elements shared), the greater the likelihood a website will be used to completing a transaction (purchase intent).

Privacy statements have been shown to assure trustworthiness and improve consumers' intent to shop and purchase online (Elliot and Speck, 2005). It is also agreed that strongly written, succinct, and graphical statements are easier to read and

understand (Meinert et al., 2006; Pan and Zinkhan, 2006; Pollach, 2006). The problem arises in statements that are vague, ambiguous, or unintelligible. Consumers simply do not read these statements and if they do, often they cannot understand them (Pollach, 2005). A statement that is not read or understood correctly cannot increase a consumer's trust. Therefore, it is hypothesized that:

- H2: When privacy statements are read by consumers, simplified, graphical representations of privacy statements will result in a greater purchase intent than textual privacy statements.

Several studies have found that privacy statements engender trust and safety and alleviate privacy concern information sharing (Culnan, 1999; Liu and Arnett, 2002; Miyazaki and Fernandez, 2001). However, in 2006, \$2 billion, or about 2% of online spending, was lost due to consumer information security concerns (InternetRetailer.com, 2006). Given such a large loss in transactions and profit, does the presence of a privacy statement reduce concern enough for the consumer to provide information to complete a transaction? Consumers must provide personal information to complete many website transactions. Since perception of privacy is a key concern of consumers' willingness to complete transactions on a website (Dubelaar et al., 2003), consumers share more personal data with collectors they trust (Nehf, Pitt, and Watson, 2007) and when perceived risk is low (LaRose and Rifon, 2007), and privacy statements alleviate concern about information sharing, it is hypothesized that:

- H3: Privacy statements will moderate the relationship between total elements shared and purchase intent.

The proposed model and hypotheses are illustrated below in Figure 1.

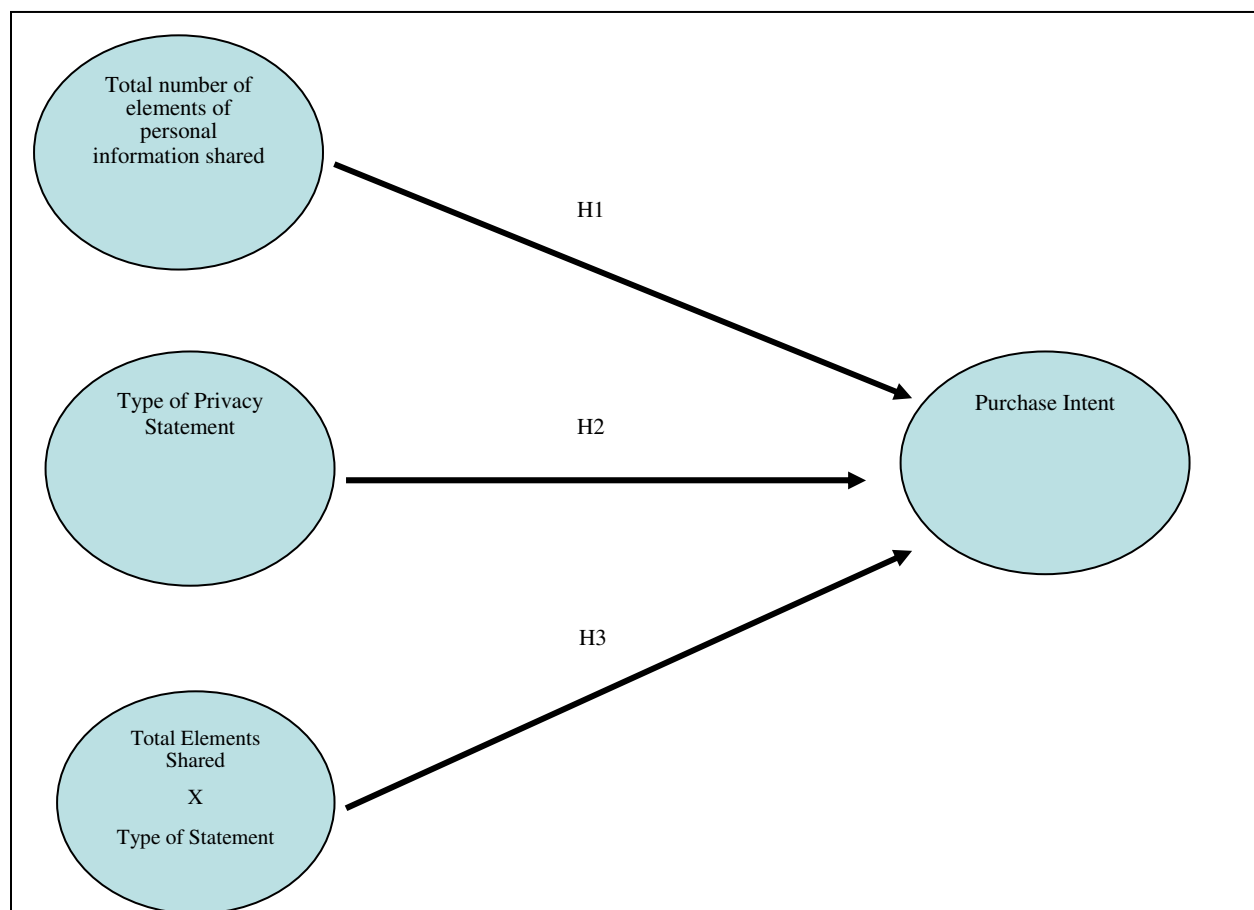


Figure 1. Proposed Model for the Moderating Effect of Privacy Statements on Willingness to Give Discrete Items of Personal Information

RESEARCH METHODOLOGY

Sample

In that this study is based on previous work, a large effect size is desired and will be assigned a large effect of .35 to clearly determine the differences between the groups. An α of .05 and power of .8 are widely accepted as appropriate values for power analyses (Cohen, 1998). Thus, with $r = .35$, $\alpha = .05$, power = .8, and four predictive variables, the resulting sample size suggested from Soper's power calculation (Soper, 2007) is 39. To achieve this sample with a response rate of at least 94% as found in similar surveys (Gefen and Ridings, 2003; Roberson and Sundstrom, 1990), the survey should be distributed to 41 or more individuals. To insure this level of response, the email invitation was sent more than 41 individuals and they were asked to forward the email to anyone they think would have an opinion on website purchasing. The sample type was a convenience sample who could be contacted quickly and would complete the survey in the requested time period. Because the survey was then forwarded to associates of those contacted by email, a random sample of website users could be achieved. A total of 59 responses were received.

Data Collection

The transaction scenario presented at the start of each survey asks participants to imagine that they are purchasing a gift for a very close friend's birthday party. It is the night before the party and they do not have time to shop at the mall. They have found the perfect gift at GiftShop.com and it is in the desired price range. After reading the selected privacy statement, they are asked to respond to eleven items. The privacy statement was of two types, one graphical and the other text. Subjects were randomly assigned to receive one type of privacy statement. The survey consists of 8 items selected from four validated surveys by Hui et al. (2007), Elliot and Speck (2005), Meinert et al. (2006), and Pan and Zinkhan (2006) concerned with consumer opinion on privacy statements, trust in websites, and types of personal information they are willing to share. Two additional demographic items were added and one additional item was added to measure likelihood of completing a transaction at a website using the particular type of privacy statement. To control for participants' prior trust levels with any particular website, only the privacy statement was posted on the survey and the website name in both statements was changed to GiftShop.com. The short statement was selected because it fit totally within a 17-inch computer screen and had only four statements. The graphical statement was selected because it too fit on a 17-inch computer screen, without the need for scrolling, and was in a table format as suggested by Pollach (2006).

Analysis

Data analysis was conducted using the SAS Version 8.2 statistical package. First, tests were conducted to determine if the data fits the assumptions of the general linear model. A confirmatory factor analysis using principal component analysis will be conducted to determine the construct validity of the concepts of acknowledgement and understanding of the statement, trust in the website, information sharing and number of elements shared. The constructs should each have correlations greater than 0.7, eigen values greater than 1, and should account for a large percentage of the variance. The effects of the independent variables on the dependent variables will also be analyzed through linear regression. The differences between the two groups will then be tested through analysis of covariance and larger betas in the paths of graphical subjects will show support for the hypotheses. Then, similar to Venkatesh and Morris (2000) who also studied factors bearing on two distinct groups, Partial Least Squares, a structural equation modeling technique, was used to analyze the data and compare with the regression results. Path coefficients of about 0.50 will show consistent correlation between the variables (Venkatesh and Morris, 2000).

RESULTS

In the final dataset which was downloaded after twelve days of internet posting, there were 59 total respondents. Of those, 8 did not fill out responses regarding website feedback and were eliminated from the data analysis. The final number of respondents included in the analysis was 51. 26 responded to the text survey and 25 responded to the graphical survey. The age of respondents ranged from 16 to 64. There were 23 male and 28 female respondents. On average, the respondents spent twenty hours a week on the internet and completed an average of four different tasks. It was of interest whether a simple written or short graphical statement would be more widely read and understood. The following table summarizes the results of this sample.

Survey Type	Statement Read	Statement Understood	Number of Respondents
Graphical	No	No	5
Graphical	Yes	No	4
Graphical	Yes	Yes	16
Text	No	No	4
Text	Yes	No	4
Text	Yes	Yes	18

		Total	51
Table 1. Respondents Reading and Comprehension of Statements			

Of interest in this study was which discrete elements of each information category, contact, biographical, and financial, consumers are willing to share in a transaction when directed to observe differing types of statements. Table 2 summarizes the results of this sample. It can be seen that the respondents were only somewhat likely to share general information like name, home address, email address and product preferences in the course of a transaction. In addition, there is very little difference in the average total number of elements the respondents were willing to share between the two statements.

Survey Type	Name	Home Addr	Work Addr	E-mail	Phone	SSN	DOB
Graphical	3.3	3	2.6	3.2	2.6	1.2	1.7
Text	3.1	2.8	1.8	3.2	2	1.3	2.2
Survey Type	Marital Status	Family Names	Product Preference	Credit Card #	Bank Acct	Salary	
Graphical	2.4	1.8	3.3	2.4	1.8	2	
Text	2.2	1.3	3.1	2.6	1.6	1.5	
Table 2. Average Likeliness Sharing Specific Elements							

The ratings from the survey questions were summed to create the scores used in the regression analysis. The final variables included in the model are summarized in the following Table 3.

Variable Type	Variable Name	Variable Description
Dependent	PurchaseIntent	The rating score of the likelihood of completing the transaction.
Independent	TotUnderstandingScore	A measure of how well the privacy statements were understood and was calculated as the sum of the elements in questions six through eight.
Independent	Read	A measure of whether or not the statement was read.
Independent	TotSharingScore	A measure of how likely elements of personal information are likely to be shared and was calculated as the sum of the elements in question nine.
Independent	TotElementsShared	The total number of elements likely to be shared with a rating of 3 or above in question nine.
Independent	TotTrustScore	The measure of how likely the site can be trusted and was calculated as the sum of question ten's elements.
Independent	Survey	Type of statement, text or graphical
Independent	Age	Respondent's age.
Independent	TotInternetTasks	Number of given tasks the respondent pursues on the internet.
Table 3. Model Variable Descriptions		

General Linear Model Fit

To determine if the responses fit the assumptions of the general linear regression model, tests were conducted for homoskedasticity and linearity. From the multiple regression analysis of variance results, the overall model is statistically significant with the probability of the F-test statistic being less than an alpha of .05. In the test of first and second moment specification, the ChiSquare statistic resulted in a $p > .05$, so it can not be rejected that the variance is constant. The Shapiro-Wilk test resulted in $p > .05$, therefore it can not be rejected that the residuals are normally distributed. Thus, the residuals of the dataset are homoskedastic and normally distributed. A Durbin-Watson test was conducted to test for autocorrelation of the residuals. The Durbin-Watson D value of .862 was less than 1.5 so there is positive autocorrelation at lag 1, meaning there could be bias in the estimated variances. However, after attempting to correct for the correlation using autoregressive models of high orders on the residuals, the autocorrelation remained. This means any identified effects could be magnified.

A multicollinearity check was conducted to assess the degree of explanatory contribution of each independent variable. Using the variance inflation indicator, none of the factors exceeds 10 resulting in little overlap in the explanatory contribution of each independent variable. Next, a principal component analysis of the correlation matrix of the independent variables. None of the condition indices was larger than ten for the four constructs. However, there were significant correlations in the proportion of variation between TotSharingScore and TotTrustScore and between TotSharingScore and TotElementsShared. This means that information sharing and trust are highly correlated and one of the construct variables could be excluded from the final model. Since the object of this analysis is prediction and not exclusion of variables, partial least squares analysis was conducted to determine the percent of variance attributable to the variables of interest. Most of the variation in the effects and dependent variables was captured in the first five factors, supporting the exclusion of either sharing or trust from the model.

Tests of Hypotheses

To address these results in terms of H1, from the results shown in Figure 2, TotTrustScore is the only significant variable in the model having a p-value < .05, so it was not dropped from the model. The TotSharingScore and TotElementsShared were not significant, although there was a positive relationship between willingness to share information and intent to purchase. Therefore, a higher willingness to share elements of personal information during a website transaction does not result in a significantly higher intent to purchase. Moreover, trust is the main factor in intent to purchase and not willingness to share or number of elements of personal information shared.

Analysis of Variance						
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F	
Model	6	38.93563	6.48927	7.30	<.0001	
Error	44	39.10359	0.88872			
Corrected Total	50	78.03922				
	Root MSE	0.94272	R-Square	0.4989		
	Dependent Mean	2.80392	Adj R-Sq	0.4306		
	Coeff Var	33.62142				
Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	Intercept	1	-0.52825	1.00319	-0.53	0.6011
age	age	1	0.01159	0.01100	1.05	0.2977
totinternettasks	totinternettasks	1	0.09952	0.12134	0.82	0.4165
totunderstandingscore	totunderstandingscore	1	-0.03135	0.02259	-1.39	0.1722
totsharingscore	totsharingscore	1	0.02950	0.03135	0.94	0.3518
totelementsshared	totelementsshared	1	-0.00689	0.10214	-0.07	0.9465
tottrustscore	tottrustscore	1	0.12504	0.02708	4.62	<.0001
Test of First and Second Moment Specification						
	DF	Chi-Square	Pr > ChiSq			
	27	26.72	0.4788			

Figure 2. ANOVA Analysis

Analysis of Covariance was used to test H2 and the results of the Least Squares Means is captured in Figure 3.

The GLM Procedure				
Least Squares Means				
survey	purchaseintent LSMEAN	H0:LSMean1=LSMean2 t Value	Pr > t	
P	2.50633910	-1.92	0.0612	
T	3.05871055			
read	purchaseintent LSMEAN	H0:LSMean1=LSMean2 t Value	Pr > t	
1	2.75782640	-0.13	0.9011	
2	2.80722325			

Figure 3. ANACOVA Analysis

The means from this sample show that viewing the graphical statement resulted in similar intent to purchase as did viewing the text statement. Given that there was no significant difference in purchasing intent between the two groups, viewing the most simplistic, graphical statement does not increase intent to purchase. In addition, reading the statement also had no significant effect on purchasing intent.

Analysis of Covariance was used again to test H3 and the results of the Type III Sums of Squares is captured in the Figure 4.

The GLM Procedure					
Dependent Variable: purchaseintent purchaseintent					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	43.98811464	4.88756829	5.88	<.0001
Error	41	34.05110105	0.83051466		
Corrected Total	50	78.03921569			
R-Square Coeff Var Root MSE purchaseintent Mean					
0.563667 32.50183 0.911326 2.803922					
Source	DF	Type I SS	Mean Square	F Value	Pr > F
survey	1	5.14536953	5.14536953	6.20	0.0170
age	1	1.14119533	1.14119533	1.37	0.2479
totinternettasks	1	1.18219021	1.18219021	1.42	0.2397
totunderstandingscor	1	7.22480246	7.22480246	8.70	0.0052
totsharingscore	1	14.20474111	14.20474111	17.10	0.0002
tolementsshared	1	0.00891273	0.00891273	0.01	0.9180
tottrustscore	1	13.42214639	13.42214639	16.16	0.0002
totsharingsco*survey	1	0.03647654	0.03647654	0.04	0.8350
tolementssh*survey	1	1.62228033	1.62228033	1.95	0.1697
Source	DF	Type III SS	Mean Square	F Value	Pr > F
survey	1	1.32197958	1.32197958	1.59	0.2142
age	1	0.83707973	0.83707973	1.01	0.3213
totinternettasks	1	0.39169722	0.39169722	0.47	0.4961
totunderstandingscor	1	0.05695141	0.05695141	0.07	0.7947
totsharingscore	1	1.00566054	1.00566054	1.21	0.2776
tolementsshared	1	0.02282364	0.02282364	0.03	0.8691
tottrustscore	1	9.64689791	9.64689791	11.62	0.0015
totsharingsco*survey	1	1.12967636	1.12967636	1.36	0.2502
tolementssh*survey	1	1.62228033	1.62228033	1.95	0.1697

Figure 4. ANACOVA Analysis

In testing for an interaction between the variables TotSharingScore and Survey, the p-value of the interaction term is greater than .05 and therefore, there is no significant interaction between the two. In addition, no interaction was found between TotElementsShared and Survey. The lack of interaction in the model passes assumption of additivity. The overall model fits the assumptions of the general linear model except for uncorrelated residuals, which would have been a concern had any of the hypothesized effects been found.

CONCLUSION

To summarize, none of the hypotheses presented in this study were accepted. First, one's willingness to share information and the number of elements likely to be shared do not have a significant effect on consumer intent to make a website purchase. Second, regardless of the type of statement presented or whether it was actually read, there is no difference in the likelihood intent to make a purchase. Third, there is no interaction between willingness to share information and privacy statement type. Thus there is no moderating effect of privacy statement type on willingness to share information. Finally, more elements of personal information are not likely to be shared when shown a simplistic graphical statement.

The results of this study bear the similar results for written privacy statements that Rifon et al. (2005) found for privacy seals. They concluded that although seals have an effect on trust, seal display did not result in higher numbers of personal information disclosures. This study concludes that statements do not result in a higher likelihood of completing a web

transaction. Thus, it is evident that privacy seals and statements have little to do with information sharing and transactions. Given these findings, other factors besides trust must be investigated to explain how and why information is shared and transactions occur on websites.

It is interesting to note that even when a privacy statement is placed in direct view of web users, they still do not read them. Nine out of fifty-one respondents in this study, eighteen percent, stated that they did not read the statement posted after the instructions. If statements and seals are not acknowledged or understood, and have no effect on providing information for transactions, then companies will have to find new measures and methods to alleviate consumers' fears. Trust is gained over time and web merchants will have to keep the number of privacy invasions low over time to increase their number of transactions.

This research has its limitations. First, our study considered one scenario in which participants imagine that they are purchasing a gift for a very close friend's birthday party. Additional scenarios could be utilized. Second, the small sample size limits the generalizability of our findings. Third, some of our hypotheses were not significant; this can be attributed to the small sample size. In spite of these limitations, we believe our research makes a valuable contribution to the area of privacy statements, information sharing and web purchasing. We recommend additional research in this area using multiple scenarios and large sample sizes.

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